

Patent claims

1. Control circuit for relay-operated gas valves, with a relay (11) for opening and/or closing a gas valve and with a failsafe circuit (12) for the relay (11), a control device being connectable to one input (13) of the failsafe circuit (12), and the failsafe circuit (12) only supplying the relay (11) with a voltage necessary for opening the gas valve when an input signal having at least two different frequency signals succeeding each other in time is supplied at an input (13) of the failsafe circuit (12) by the control device.

2. Control circuit as claimed in claim 1, characterized in that the failsafe circuit (12) includes a charging circuit (14), the charging circuit (14) having at least one capacitor (16), and the charging circuit (14) charging at least one of the capacitors (16) of the charging circuit (14) upon the application or presence of a first frequency signal in the input signal.

3. Control circuit as claimed in claim 2, characterized in that the charging circuit (14) charges the capacitor (16) or each capacitor (16) of the same exclusively upon the presence of the first frequency signal in the input signal.

4. Control circuit as claimed in claim 2 or 3, characterized in that the charging circuit (14), upon the application or presence of a second frequency signal in the input signal, the second frequency signal having a lower frequency than the first frequency signal, does not charge the capacitor (16) or capacitors (16) of the charging circuit.

5. Control circuit as claimed in one or more of claims 2 to 4, characterized in that, upon the application or presence of a second frequency signal in the input signal, the second frequency signal having a lower frequency than the first frequency signal, the capacitor (16) or each capacitor (16) of the charging circuit (14) discharges.

6. Control circuit as claimed in one or more of claims 1 to 5, characterized in that the failsafe circuit (12) includes a drive circuit (15) for the relay (11), the drive circuit (15), upon the application or presence of the second frequency signal in the input signal, supplying the relay (11) with a voltage necessary for opening the gas valve.

7. Control circuit as claimed in claim 6, characterized in that the drive circuit (15) has at least two transistors (24, 25), a base of a first transistor (24) being connected via a resistor (26) to a capacitor (16) of the charging circuit (14), and the first transistor (24) of the drive circuit (15) only conducting when the capacitor (16) of the charging circuit (14) discharges itself upon the application of the second frequency signal in the input signal.

8. Control circuit as claimed in claim 7, characterized in that a collector of the first transistor (24) is connected via an interposed resistor (24) to a supply voltage (V), and that an emitter of the first transistor (24) is connected to a ground potential.

9. Control circuit as claimed in claim 7 or 8, characterized in that a second transistor (25) is switched with the first transistor (24) in such a manner that a collector of the second transistor (25)

is connected to the base of the first transistor (24) and an emitter of the second transistor (25) is connected to a ground potential.

10. Control circuit as claimed in claim 9, characterized in that a base of the second transistor (25) is switched over an interposed resistor (28) with the input (13) of the failsafe circuit (12).

11. Control circuit as claimed in one or more of claims 6 to 10, characterized in that the failsafe circuit (15) for the relay (11) further in each case has two Darlington transistor circuits (29, 30), a diode (34) connected in parallel to the relay (11) and, making contact between the two Darlington transistor circuits (29, 30), a series connection of a resistor (32) and a capacitor (33).

12. Control circuit as claimed in one or more of claims 1 to 11, characterized in that the first frequency signal has a frequency of around 1000 kHz and the second frequency signal has a frequency of around 5 kHz, the two frequency signals being applied in the input signal succeeding one another in time in such a manner that in each case a time span of around 40 ms with the first frequency signal of around 1000 kHz is followed by a time span of around 80 ms with the second frequency signal of around 5 kHz.

13. Control circuit as claimed in one or more of claims 1 to 12, characterized in that it only supplies the relay with a voltage necessary opening the gas valve if the two different frequency signals are applied succeeding each other in time by definition in the input signal.